



RTCA, Inc.

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October 20, 2020

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th St S.W., Room TW-A325
Washington, DC 20554

via ECFS

Re: Notice of Ex Parte Meeting, GN Docket No. 18-122

Dear Ms. Dortch,

On the 16th of October 2020 Terry McVenes, President of RTCA, Inc (formally Radio Technical Commission for Aeronautics) along with the leadership of the SC-239 Low Range Radar Altimeter committee and staff from RTCA (the “RTCA Representatives”, See Annex A) met by webex with Ken Baker, Tom Derenge, and Janet Young of the Wireless Telecommunications Bureau (WTB) and Ira Keltz, Michael Ha, Bahman Badipour and Bob Pavlak of the Office of Engineering and Technology (OET). This ex parte is submitted as notice of that meeting as required by the Commission’s rules.

In the meeting, the RTCA Representatives talked through the results of the public multi stakeholder group formed by RTCA in Apr 2020 in response to the FCC C-Band Report and Order.¹ As part of that discussion, the attendees reviewed the final technical report developed by the multi stakeholder group: “Assessment of C-Band Mobile Telecommunications Interference Impact on Low Range Radar Altimeter Operations,” which was previously entered into the public record.² The supporting slides, as presented, are attached in Annex B.

RTCA, Inc. and the SC-239 leadership are available to answer any technical questions that arise regarding this report.

Respectfully submitted,

/s/ Terry McVenes
Terry McVenes
President & CEO, RTCA, Inc.

¹ See Ex parte from RTCA, Notice of Multi-Stakeholder Group Meeting, Dated Apr 20, 2020, Docket 18-122

² See Ex parte from Terry McVenes, Report from RTCA Multi-Stakeholder Group: Assessment of C-Band Mobile Telecommunications Interference Impact on Low Range Radar Altimeter Operations, Dated Oct 8, 2020, Docket 18-122



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Annex A – RTCA Attendees

Clay Barber
Seth Frick
Sai Kalyanaraman
Terry McVenes
Rebecca Morrison
Jean-Luc Robin
Al Secen

RTCA Program Management Committee Member
RTCA SC-239 Co-Chair
RTCA SC-239 Secretary
RTCA President
RTCA Program Director
RTCA SC-239 Co-Chair
RTCA Vice President



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Annex B – RTCA Multi-Stakeholder Group Output Review

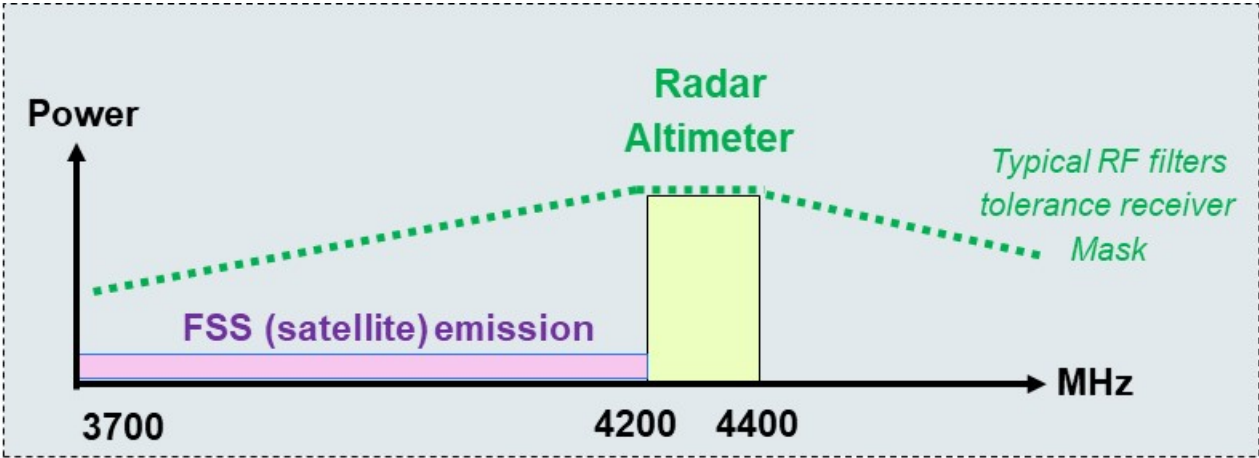


RTCA C-Band Multi Stakeholder Group
SC-239 5G Task Force

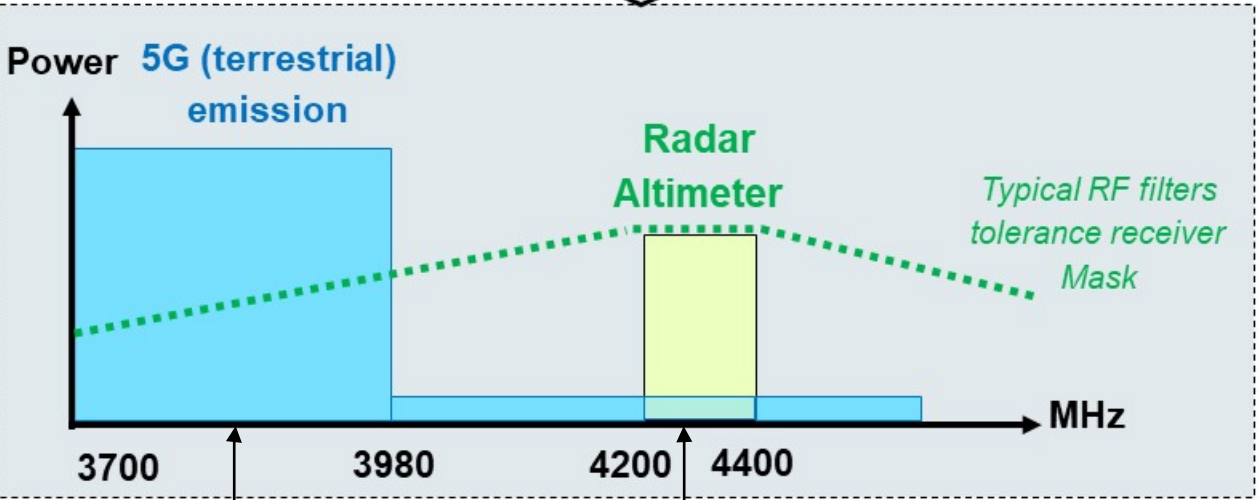
REPORT OVERVIEW

**Assessment of C-Band (3.7–3.98 GHz) Mobile
Telecommunications Interference Impact on Low Range
Radar Altimeter Operations**

RTCA MSG Report Context



Existing Spectral Environment



Future Spectral Environment

1- Blocking phenomenon

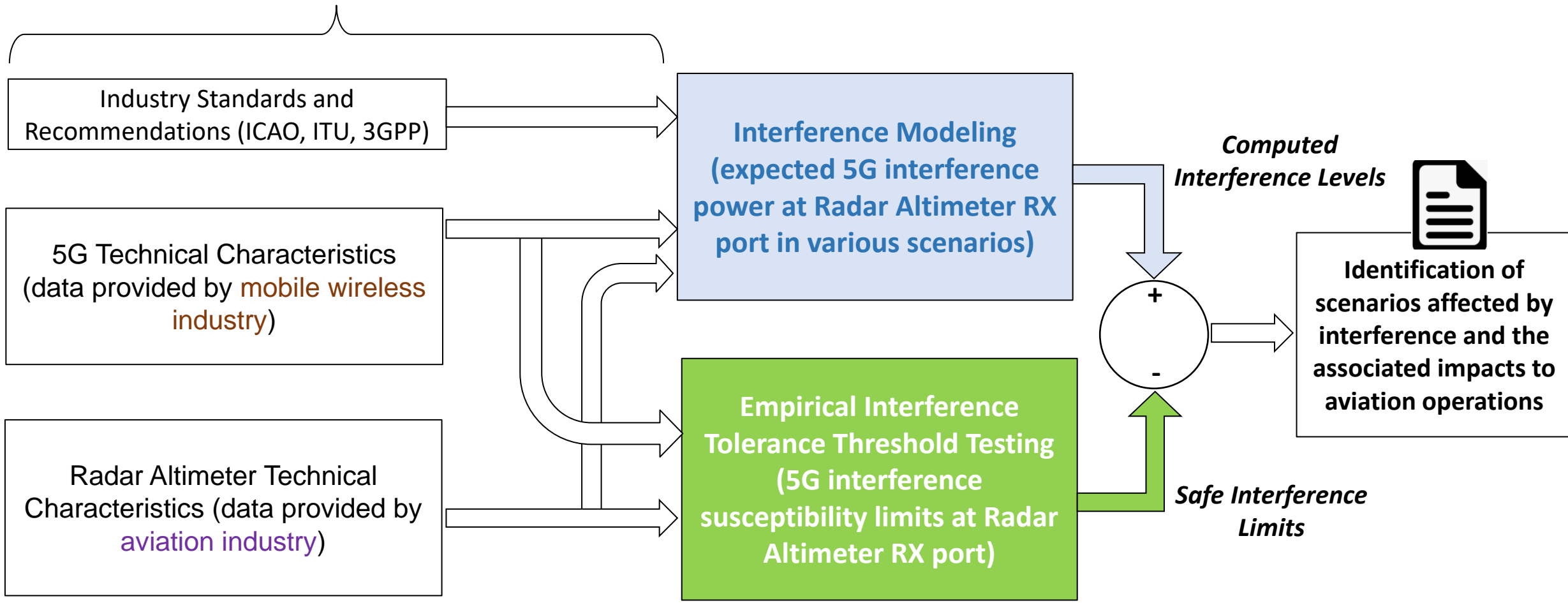
2- Spurious phenomenon

- RTCA established public MSG on Apr 20
 - Public announcement in FCC 18-122 Docket open to any and all interests
 - Fully public group, RTCA membership not required (a first for RTCA)
 - Intended scope was to deliver a factual technical report to assess the potential for interference
- Developed consensus-based approach to both the process and the work
 - 20 orgs participated in the group across different interests and industries
 - Telecom industry parameters were obtained via facilitation by the leadership of TWG-3 to validate the data used in the report and to enhance the analysis
- Report finalized and published for public comments in September
 - Followed established process used for aviation certification standards
 - Reconciled comments and final report published Oct 7

RTCA MSG Report Methodology



INPUT from applicable industry standards, recommendations, and regulations. Additional technical characteristics and assumptions received from both the mobile wireless and aviation industries representatives.



RTCA MSG Report Results



Usage Category 1

(Commercial airplanes used for passenger travel and cargo transport)

LIMITED NUMBER OF 5G SCENARIOS INVOLVED

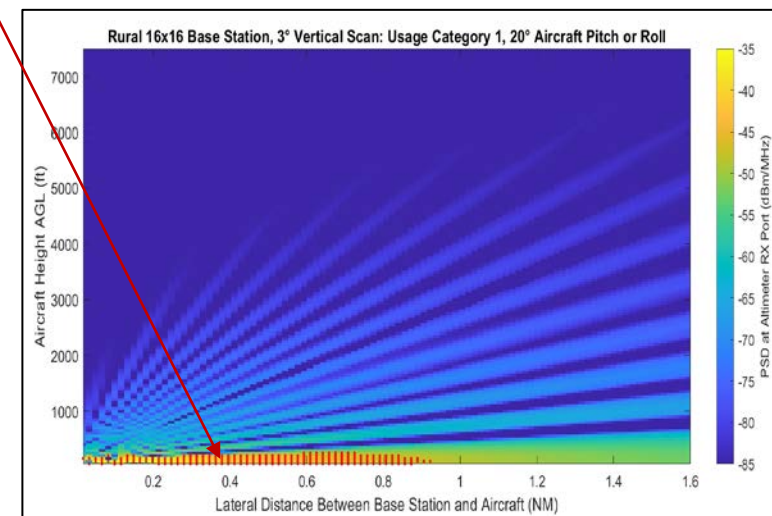
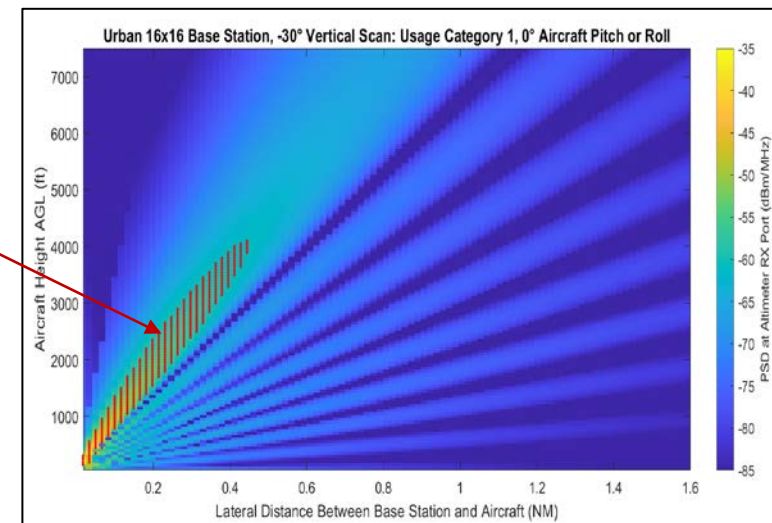
The impact to Radar Altimeters is limited to a set of specific scenarios, with only some base station configurations producing interference above the safe limit, and only for certain combinations of aircraft altitude and lateral distance between the aircraft and base station.

BUT EXTREME IMPACT ON AIRCRAFT

Although the interference impacts for Usage Category 1 only arise in certain scenarios, the extent and safety consequences of those impacts are extreme:

- Unreliable RA signals delivered to the critical aircraft systems: Auto Pilot, Flight Controls, Terrain Avoidance, Cockpit Displays.
- Catastrophic impact with the ground, leading to multiple fatalities, is possible.

Red dots mean that the safe interference limit is exceeded



RTCA MSG Report Results



Usage Category 2 and 3

(Business aviation, general aviation, and regional transport airplanes) and (both transport and general aviation helicopters)

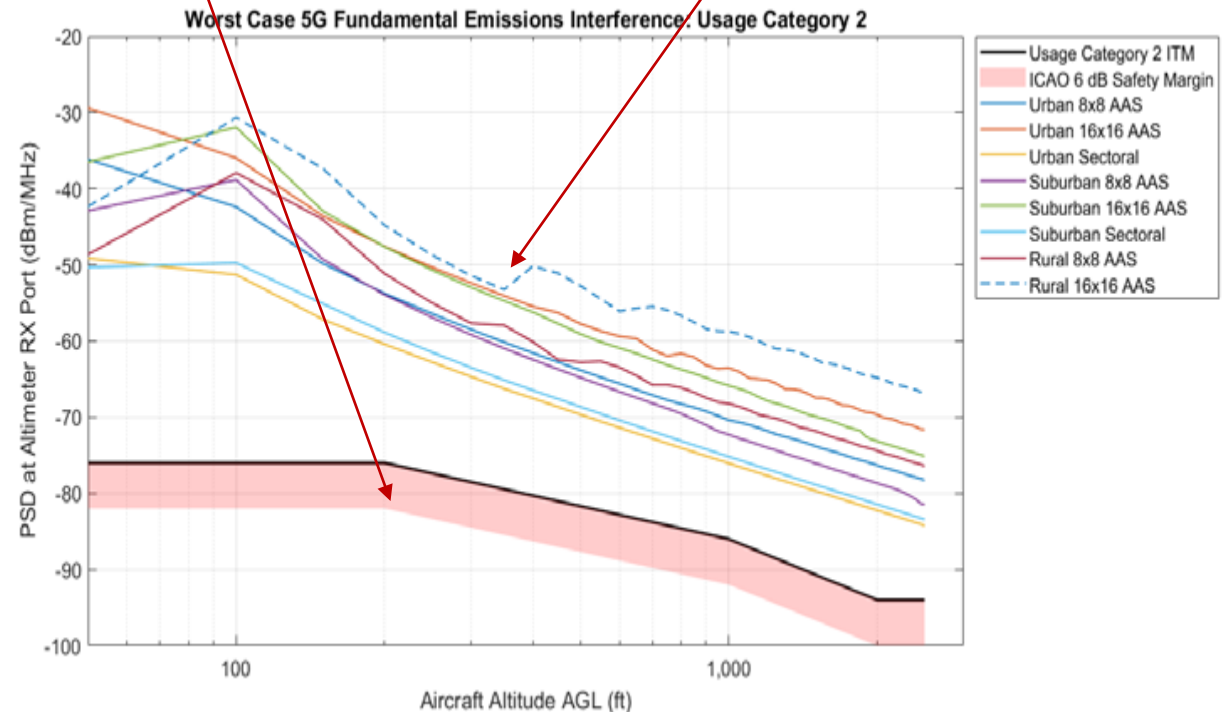
HUGE AMOUNT OF SCENARIOS INVOLVED

Every base station configuration produces harmful interference both from 5G fundamental emissions in the 3.7–3.98 GHz band and 5G spurious emissions* in the 4.2–4.4 GHz band, across virtually all operational scenarios and relative geometries between the aircraft and base station.

5G user equipment that may be operating onboard aircraft were also found to exceed the safe interference limits for Usage Categories 2 and 3.

Safe interference limit

Expected 5G interference levels



*Note: 5G spurious emissions level is not compliant with ITU-R 2059 international recommendation

CONCLUSION

of the RTCA SC-239 5G TF MSG



- The planned deployment for 5G in the 3.7–3.98 GHz band poses a severe risk to aviation operations
 - For Usage Category 1: fundamental emissions cause harmful interference. Limited number of 5G scenarios involved but extreme consequences on the aircraft (RA is the most critical RF sensor)
 - For Usage Category 2 and 3: Both fundamental and spurious 5G emissions cause harmful interference. Large number of 5G scenarios involved
- Developed within a public process as a multi stakeholder group
 - Most detailed assessment to date on the observed interference susceptibility of currently fielded Radar Altimeters
- Concurrently aviation industry is looking to modernize altimeter performance standards
 - Standards work undertaken in both RTCA and EUROCAE over next few years
 - Retrofit of aircraft is part of at least a decade process

Way Forward: Now looking to support mitigations development in order to allow both : rapid deployment of 5G and safe operations of aircraft

THANK YOU FOR
YOUR ATTENTION